Oxford Cambridge and RSA

OCR-set Assignment

Sample Assessment Material

OCR Level 3 Alternative Academic Qualification Cambridge Advanced National in Computing: Application Development

Unit F166: Software development

Scenario Title: Final Vinyl

Valid for assessment from September 20XX to 20XX.
For use by students beginning the qualification in September 20XX.

This is a sample OCR-set assignment which should only be used for practice**.**

This assignment **must not** be used for live assessment of students.

The live assignments will be available on our secure website, 'Teach Cambridge'.

The OCR administrative codes linked to this unit are:

- Unit entry code F166
- Certification code H129

The regulated qualification number linked to this unit is: 610/3975/5

Duration

About 15 hours of supervised time (GLH)
(work that **must** be completed under teacher supervised conditions)

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Information and instructions for Teachers

Using this assignment

This assignment provides a scenario and set of related tasks that reflect the development of a software solution to meet a specific problem based on a set of client requirements.

You can give this to students on or after 1 June 202X to help them understand it before they start using it for assessment. The dates for which students can use it for assessment are shown on the front cover.

The assignment:

- Is written so that students have the opportunity to meet the requirements of all assessment criteria for the unit.
- Will tell students if their evidence must be in a specific format. If the task does not specify a format, students can choose the format to use.
- **Must** be completed under teacher supervision. Any unsupervised time allowed will be stated below and explained in the assessment guidance.

We have estimated that this assignment will take about 15 hours of supervised time to complete. Students should need approximately:

- 5 hours to complete Task 1.
- 8 hours to complete Task 2.
- 2 hours to complete Task 3.

You **must**:

- Use an OCR-set assignment for summative assessment of students.
- Familiarise yourself with the assessment criteria and assessment guidance for the tasks. These are given at the end of each student task. They are also with the unit content in **Section 5** of the Specification.
  Assessment guidance is only given where additional information is needed. There might not be assessment guidance for each criterion.
- Make sure students understand that the assessment criteria and assessment guidance tell them in detail what to do in each task.
- Read and understand **all** the rules and guidance in **Section 7** of the Specification **before** your students start the set assignments.
- Make sure that your students complete the tasks and that you assess the tasks fully in line with the rules and guidance in **Section 7** of the Specification.
- Give your students the **Application Development Student guide to NEA assignments before** they start the assignments.

You **must not**:

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- Use live OCR-set assignments for practice or formative assessment. This sample assessment material **can** be used for practice or formative assessment.
- Use this sample assessment material for live assessment of students.
- Allow group work for **any** task in this assignment.
- Change any part of the OCR-set assignments or assessment criteria.

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Pages 1-4 are for teachers only. Please do **not** give **Pages 1-4** to your students.

You can give **any** or **all** of the pages **that follow** to your students.

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Tasks for students and assessment criteria

Unit F166: Software development

Scenario Title: Final Vinyl

Valid for assessment from September 20XX to 20XX.
For use by students beginning the qualification in September 20XX.

Scenario

Final Vinyl sells second hand vinyl records from the 1960s, 70s, 80s and 90s. It's order system works as follows.

Customers need to set up an account with Final Vinyl. To set up an account customers need to provide the following information:

- Name.
- Address.
- Telephone Number.
- Email address.

Customers are then allocated a unique customer number.

Once an account has been set up customers can place an order for delivery. Orders can be taken in person, via email or over the phone.

An extract of Final Vinyl's stock list is given below:

ID	Category	Artist	Title	Price (including VAT)
17	1960s	The Merseybeats	Don't Turn Around	£5.00
18	1960s	Elvis Presley	Can't Help Falling in Love	£4.50
19	1960s	The Singing Nun	Dominique	£2.50
86	1970s	Blue Mink	Stay With Me	£3.50
87	1970s	David Bowie	Life on Mars	£15.00
54	1980s	The Police	Message in a Bottle	£13.00
55	1980s	Gloria Estefan	Anything for You	£4.00
45	1990s	Alison Limerick	Make it on My Own	£4.50
46	1990s	Mariah Carey	Dreamlover	£14.50

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An example of an invoice is given below.

Order from: Sundip Kofi
84 The Sphere
Circle Street
Long Garden

Customer ID: 10045
Invoice ID: 2045
Date of Order: 23rd March 2023

ID	Description	
17	The Merseybeats – Don't Turn Around	£5.00
86	Blue Mink – Stay With Me	£3.50
45	Alison Limerick – Make it on My Own	£4.50
	Total ex. VAT	£10.83
	VAT at 20%	£2.17
	TOTAL	£13.00

You have been commissioned by Final Vinyl to create a new software solution. The software solution will:

- Store customers' details.
- Store a stock list.
- Produce an invoice for each customer order.
- Output the total value of sales for any given week.

The software solution must only allow customers to purchase one copy of each record. The software solution must include passwords, data entry error handling and backup of files.

The software solution should be limited to the requirements above. The user of the software solution has limited computer experience and all areas of the software solution need to be accessible from a central menu.

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Task 1
Designing the software solution

Topic Areas 1, 2, 4 and 5 are assessed in this task.

The task is:

Design the software solution for Final Vinyl.

You will:

- Create a Software Design Specification (SDS) and Software Design Documentation (SDD).
- Describe how the software solution will be tested.

Your evidence **must** include:

- A Software Design Specification (SDS).
- Software Design Documentation (SDD).
- Written evidence.

Use the assessment criteria below to tell you what you need to do in more detail.

Pass	Merit	Distinction
P1: Describe the solution overview for the software solution. (PO2)	**M1: Explain** how the functional and non-functional requirements impact the design of the software solution. (PO2)	**D1: Explain** how constraints impact the design for the software solution. (PO2)
P2: Describe the client requirements for the software solution. (PO2)		
P3: Create data structure and interface designs for the software solution. (PO4)	**M2: Explain** how the software design documentation created allows the requirements of the SDS to be realised. (PO2)	**D2: Assess** the software solution design in relation to the software design principles. (PO3)
P4: Create data flow diagrams and algorithm designs for the software solution. (PO4)		
P5: Describe how the software solution will be tested. (PO2)	**M3: Justify** the appropriateness of the testing. (PO3)	

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Assessment guidance

This assessment guidance gives you information to meet the assessment criteria. There might not be additional assessment guidance for each criterion. It is only given where it is needed. You must read this guidance before you complete your evidence.

Assessment Criteria	Assessment guidance
P1	• Students **must** extract the specific objectives of the software solution from the scenario and describe them in a Software Design Specification (SDS).
P2	• Students **must** describe the client requirements in a Software Design Specification (SDS) expanding the descriptions into specific requirements which can be used as criteria to review against in **Task 3**.
P3	• Students **must** create data structure and interface designs for the software solution. The data structure design(s) **must** show how the data will be stored. Students **must** use at least **one** of the software design tools in Topic Area 2.1.2. The designs must contain enough detail for them to be interpreted by someone who hasn't seen them before.
P4	• Students **must** create data flow diagrams to show how data will flow through the software solution. Students **must** use at least **one** of the software design tools in Topic Area 2.1.2 to create algorithm designs for the software solution. The designs must contain enough detail for them to be interpreted by someone who hasn't seen them before.
P5	• Students **must** describe the testing methods and testing types they will use to test the software solution and the elements of the software solution they intend to test. The description of how the software solution will be tested **could** include the content in Topic Area 4.1.
M1	• M1 is an extension of P1 and P2. Students **must** explain how the functional and non-functional requirements of the solution will influence the design of the software solution.
M2	• Students **must** explain how each of the designs created in P3 and P4 (data structure, interface, data flow and algorithms) relate to the requirements detailed in the SDS.
M3	• Students **must** justify the approach to testing detailed in P5.
D1	• Students **must** consider at least **three** potential constraints and explain how they would impact the design of the software solution.
D2	• Students **must** assess the extent to which the software design principles in Topic Area 1.1 have been applied to the software solution design. The criterion is achieved if students consider at least **three** of the software design principles.

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Task 2
Creating the software solution

Topic Areas 1 and 3 are assessed in this task.

The task is:

Create the software solution that you designed in **Task 1**.

You will:

- Use programming techniques and technical skills to create a coded software solution.

Your evidence **must** include:

- Source code.
- The final software solution in a format which allows it to be viewed/used without the need to install any specialist software **or** video/screen recordings demonstrating the software solution.

Use the assessment criteria below to tell you what you need to do in more detail.

Pass	Merit	Distinction
P6: Create a user interface for the software solution. (PO4)	**M4: Use** programming techniques to implement appropriate file manipulation in the software solution. (PO4)	**D3: Use** programming techniques to implement appropriate encapsulation in the software solution. (PO4)
P7: Create the output(s) for the software solution. (PO4)	**M5: Use** programming techniques to implement appropriate data structures in the software solution. (PO4)	**D4: Use** programming techniques to implement appropriate searching and/or sorting in the software solution. (PO4)
P8: Use programming techniques to implement appropriate selection and iteration in the software solution. (PO4)	**M6: Use** programming techniques to implement appropriate error handling in the software solution. (PO4)	
P9: Use source code comments, indentation and version control to make the software solution maintainable. (PO4)		
P10: Use appropriate naming conventions and data types in the		

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software solution. (PO4)		

Assessment guidance

This assessment guidance gives you information to meet the assessment criteria. There might not be additional assessment guidance for each criterion. It is only given where it is needed. You must read this guidance before you complete your evidence.

Assessment Criteria	Assessment guidance
Task 2	• Ideally, students will create the software solution designed in **Task 1**. However, if students deviate from the design(s) they should not be penalised when assessing **Task 2.** • To confirm assessment decisions made for some of the criteria for this task, the OCR assessor will need to be able to see the final software solution. Therefore, students **must** provide either: o The final software solution in a format which allows it to be viewed/used without the need to install any specialist software. o Video/screen recordings of the final software solution being demonstrated.
P6	• Students **must** create a user interface for the software solution. The final software solution will be sufficient evidence for this assessment criterion.
P7	• Students **must** create the output(s) for the software solution. The final software solution will be sufficient evidence for this assessment criterion.
P8	• Students **must** use the programming techniques in Topic Area 3.1 (as required) to add selection and iteration to the software solution, so it functions as intended. The source code from the final software solution will be sufficient evidence for this assessment criterion.
P9	• Students **must** use the technical skills in Topic Area 3.2 (as required) to ensure the code is maintainable. For the code to be maintainable, someone who hasn't seen it before **must** be able to be interpret it. This assessment criterion **could** be evidenced by the source code from the final software solution and screen shots or photographs showing the use of version control.
P10	• Students **must** use a consistent and understandable naming convention for variables, constants, files, data structures and encapsulation. For the naming conventions to be understandable, someone who hasn't seen the code before **must** be able to be interpret it. The source code from the final software solution will be sufficient evidence for this assessment

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	criterion.
M4	• Students **must** use the programming techniques in Topic Area 3.1 (as required) to add file manipulation to the software solution, so it functions as intended. The source code from the final software solution will be sufficient evidence for this assessment criterion.
M5	• Students **must** use the programming techniques in Topic Area 3.1 (as required) to create the data structures for the software solution so it functions as intended. The source code from the final software solution will be sufficient evidence for this assessment criterion.
M6	• Students **must** use the programming techniques in Topic Area 3.1 (as required) to add error handling during user input to prevent the software solution from unexpected and unintended closure. The source code from the final software solution will be sufficient evidence for this assessment criterion.
D3	• Students **must** use the programming techniques in Topic Area 3.1 (as required) to add encapsulation that improves the efficiency of the software solution. The source code from the final software solution will be sufficient evidence for this assessment criterion.
D4	• Students **must** use the programming techniques in Topic Area 3.1 (as required) to add searching and/or sorting to the software solution, so it functions as intended. The source code from the final software solution will be sufficient evidence for this assessment criterion.

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Task 3
Testing and reviewing the software solution.

Topic Areas 4 and 5 are assessed in this task.

The task is:

Test and review the software solution you created in **Task 2**.

You will:

- Test the software solution using the testing described in **Task 1**.
- Review the software solution.

Your evidence **must** include:

- Documented test results.
- Written evidence.

Use the assessment criteria below to tell you what you need to do in more detail.

Pass	Merit	Distinction
P11: Test the software solution and document results. (PO4)	**M7: Analyse** test results documenting any required remedial action. (PO3)	**D5: Discuss** potential improvements and further development opportunities for the software solution. (PO3)
P12: Assess the suitability of the software solution for meeting the requirements. (PO3)		

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Assessment guidance

This assessment guidance gives you information to meet the assessment criteria. There might not be additional assessment guidance for each criterion. It is only given where it is needed. You must read this guidance before you complete your evidence.

Assessment Criteria	Assessment guidance
P11	• Students **must** test the software solution and document results. Ideally students will use the approach described and justified in **Task 1**. However, if students deviate from the proposed testing they should not be penalised. • Students **must** have evidence of the actual test results for example screen shots, photographs or video/screen recordings.
P12	• Students **must** assess the suitability of the software solution for meeting the requirements in Topic Area 5.1.
M7	• Students **must** analyse the test results generated in P11 and explain any remedial action required to resolve the issues found during testing. Students are not expected to fix errors found in the software solution during final testing.
D5	• Having assessed the suitability of the software solution (P12) and analysed test results (M7), students **must** discuss potential improvements and further developments to the software solution.

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Template for test table

Test number	Test type	Test description	Test data	Expected result	Actual result	Remedial action required

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NEA command words

The table below shows the command words that may be used in the NEA assignments and/or assessment criteria.

Command Word	Meaning
Adapt	• Change to make suitable for a new use or purpose
Analyse	• Separate or break down information into parts and identify their characteristics or elements • Explain the different elements of a topic or argument and make reasoned comments • Explain the impacts of actions using a logical chain of reasoning
Assess	• Offer a reasoned judgement of the standard or quality of situations or skills. The reasoned judgement is informed by relevant facts
Calculate	• Work out the numerical value. Show your working unless otherwise stated
Classify	• Arrange in categories according to shared qualities or characteristics
Compare	• Give an account of the similarities and differences between two or more items, situations or actions.
Conclude	• Judge or decide something
Describe	• Give an account that includes the relevant characteristics, qualities or events
Discuss (how/whether/etc)	• Present, analyse and evaluate relevant points (for example, for/against an argument) to make a reasoned judgement
Evaluate	• Make a reasoned qualitative judgement considering different factors and using available knowledge/experience
Examine	• To look at, inspect, or scrutinise carefully, or in detail
Explain	• Give reasons for and/or causes of something • Make something clear by describing and/or giving information
Interpret	• Translate information into recognisable form • Convey one's understanding to others, e.g. in a performance
Investigate	• Inquire into (a situation or problem)
Justify	• Give valid reasons for offering an opinion or reaching a conclusion
Research	• Do detailed study in order to discover (new) information or reach a (new) understanding
Summarise	• Express the most important facts or ideas about something in a short and clear form

We might also use other command words but these will be:

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- Commonly used words whose meaning will be made clear from the context in which they are used
- Subject specific words drawn from the unit content.

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